

# The John Wesley Powell Center for Analysis and Synthesis

## NASA'S GRACE SATELLITE: WHAT IT CAN AND CANNOT TELL US ABOUT CHANGES IN THE AMOUNT OF GROUNDWATER IN STORAGE

**When:** Monday, November 18, 2019 at 11 am MST

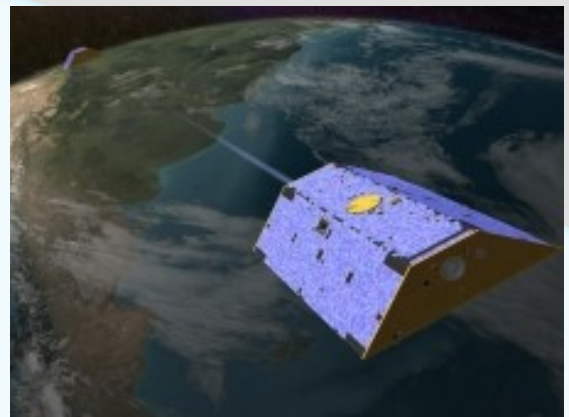
**Where:** Online at [zoom.us/j/663855534](https://zoom.us/j/663855534)

USGS Building, Reston, VA - Room 2A405

Denver Federal Center, Denver, CO - Building 810, Room 2500

**By:** Dr. Ward Sanford, USGS

NASA's GRACE satellite has been measuring spatial and temporal changes in the earth's gravitation field for more than 15 years. Much of the effort that has gone into interpreting the GRACE data has focused on estimating multi-year storage declines resulting from, e.g., regional groundwater extraction or the melting of glaciers. NASA in the meantime has provided downscaled (100-km resolution) global maps of change in water storage. These maps have tempted researchers to use the data to interpret local water storage changes. An explanation of the way the data is collected can demonstrate the appropriate spatial scale for its application. On the other hand, few studies have examined the implications of the seasonal water storage signal detected by GRACE. As one aspect of the USGS Powell Center study on the integration of GRACE data interpretation with ground-based monitoring and modeling, we are examining seasonal GRACE signals and correlating them to seasonal gravity signals that have been quantified for the conterminous United States (CONUS). Independent estimates have been made of seasonal changes in snowpack, soil water, surface water, and groundwater storage as well as man-made impacts such as irrigation pumping from regional aquifers. The decomposition of the GRACE seasonal signal into its hydrologic components is providing important constraints on aquifer storage properties as part of our ongoing work to calibrate a national-scale groundwater model of the CONUS.



Artistic representation of NASA's pair of GRACE satellites

Powell Center Working Group: [Integrating GRACE Satellite and Ground-based Estimates of Groundwater Storage](#)